National Institute of Environmental Health Sciences

Climate change and occupational heat stress: Methods for assessment

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Abstract:

BACKGROUND: Presumed effects of global warming on occupational heat stress aggravate conditions in many parts of the world, in particular in developing countries. In order to assess and evaluate conditions, heat stress must be described and measured correctly. OBJECTIVE: Assessment of heat stress using internationally recognized methods. DESIGN: Two such methods are wet bulb globe temperature (WBGT; ISO 7243) and predicted heat strain (PHS; ISO 7933). Both methods measure relevant climatic factors and provide recommendations for limit values in terms of time when heat stress becomes imminent. The WBGT as a heat stress index is empirical and widely recognized. It requires, however, special sensors for the climatic factors that can introduce significant measurement errors if prescriptions in ISO 7243 are not followed. The PHS (ISO 7933) is based on climatic factors that can easily be measured with traditional instruments. It evaluates the conditions for heat balance in a more rational way and it applies equally to all combinations of climates. RESULTS: Analyzing similar climatic conditions with WBGT and PHS indicates that WBGT provides a more conservative assessment philosophy that allows much shorter working time than predicted with PHS. CONCLUSIONS: PHS prediction of physiological strain appears to fit better with published data from warm countries. Both methods should be used and validated more extensively worldwide in order to give reliable and accurate information about the actual heat stress.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2997731

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Injury, Other Health Impact

Other Health Impact: heat stress

Intervention: ☑

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Workers

Resource Type: ☑

format or standard characteristic of resource

Policy/Opinion, Research Article

Resilience: ☑

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

Timescale: ☑

time period studied

Time Scale Unspecified